

IN THE CLAIMS:

Please amend Claims 1, 10, 17, and 20, and add new Claims 24 and 25, to read as follows. In accordance with the Revised Amendment Format, the status of all claims and the markings in the "Currently amended" Claims 1, 10, 17, and 20 are presented below.

1. (Currently amended) A probe for detecting light or irradiating light, comprising:

a cantilever supported at an end thereof by a substrate;

a hollow tip formed at a free end of said cantilever;

a microaperture formed at the end of said tip; and

a groove formed inside said cantilever, said groove comprising a hollow waveguide formed inside said cantilever and a mirror; and

a mirror at an end of said hollow waveguide at the tip side, wherein the direction of the end of said tip is substantially perpendicular to the longitudinal direction of said cantilever, and said mirror is an end face of the groove and reflects the light entering from the microaperture toward the hollow waveguide or reflects the light transmitted in said hollow waveguide toward said microaperture.

2. (Original) The probe according to Claim 1, wherein said waveguide has a V-shaped transversal cross section.

3. (Original) The probe according to Claim 1, wherein said waveguide has a trapezoidal transversal cross section.

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4. (Original) The probe according to Claim 1, wherein said waveguide has a U-shaped transversal cross section.

5. (Original) The probe according to Claim 1, wherein said tip is shaped as a square cone.

6. (Previously canceled)

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7. (Original) The probe according to Claim 1, wherein said cantilever is principally composed of silicon.

8. (Previously canceled)

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9. (Original) The probe according to Claim 1, wherein said mirror is a concave mirror.

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10. (Currently amended) A method for producing a probe for light detection or light irradiation, which comprises the steps of:

working a substrate to form a groove and a mirror at an end of the groove therein,

said mirror being a slanted or a concave end face of the groove,

forming a flat plate-shaped cover portion on the groove to form a hollow waveguide having an opening in a part thereof,

forming a hollow tip having a microaperture on the opening, and

removing a part of the substrate by etching, to form a cantilever.

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11. (Previously amended) The method according to Claim 10, wherein said groove and said mirror are formed by etching said substrate.

12. (Previously amended) The method according to Claim 11, wherein said groove and said mirror are formed by crystal-anisotropic etching of said substrate.

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13. (Original) The method according to Claim 10, further comprising a surface treatment step of forming said groove or said cover portion into a mirror surface state.

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14. (Previously amended) The method according to Claim 10, wherein said cover portion is formed from an SOI (silicon on insulator) layer of an SOI substrate.

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15. (Original) The method according to Claim 10, wherein said cover portion is formed by filling said groove with a resin layer and forming a metal film on said resin layer.

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16. (Previously amended) The method according to Claim 10, wherein said step of forming said hollow tip having said microaperture on said opening comprises the steps of:

forming a film of a tip material on a recess formed on a substrate,
transferring the tip material onto the opening, and

etching the end of a hollow tip resulting from the transferring step to form the microaperture.

17. (Currently amended) ~~The~~ A surface observation apparatus provided with at least one probe selected from the group consisting of probes according to any one of Claims 1 to 5, 7 and 9.

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18. (Previously amended) An exposure apparatus provided with at least one probe selected from the group consisting of probes according to any one of Claims 1 to 5, 7 and 9.

19. (Previously amended) An information processing apparatus provided with at least one probe selected from the group consisting of probes according to any one of Claims 1 to 5, 7 and 9.

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20. (Currently amended) ~~The~~ A surface observation apparatus provided with at least one probe selected from the group consisting of probes produced by a method according to any one of Claims 10 to 16.

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21. (Previously added) An exposure apparatus provided with at least one probe selected from the group consisting of probes produced by a method according to any one of Claims 10 to 16.

22. (Previously added) An information processing apparatus provided with at least one probe selected from the group consisting of probes produced by a method according to any one of Claims 10 to 16.

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23. (Previously added) A probe according to Claim 1, wherein said mirror is a slanted face.

24. (New) The probe according to Claim 1, wherein a light toward the microaperture reflected by the mirror generates near field light in the vicinity of the microaperture.

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25. (New) The probe according to Claim 1, wherein a light toward the hollow waveguide reflected by the mirror is a propagating light passing through the microaperture.
